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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|------------------------|---------------------|------------------|
| 10/731,161 | 12/10/2003 | Kerstin Schierle-Armdt | 54142 | 5088 |

7590

10/10/2006

Herbert B. Keil
KEIL & WEINKAUF
1350 Connecticut Ave., N.W.
Washington, DC 20036

EXAMINER

KEMMERLE III, RUSSELL J

ART UNIT

PAPER NUMBER

1731

DATE MAILED: 10/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/731,161

Applicant(s)

SCHIERLE-ARNDT ET AL.

Examiner

Russell J. Kemmerle III

Art Unit

1731

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 December 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

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Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application
- ☐ Other: _____.

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Specification

The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

Arrangement of the Specification

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
 - (1) Field of the Invention.
 - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

The disclosure is objected to because of the following informalities:

Page 1 line 4: "proc ss" appears to be a mistyping of "process"

Page 4 line 26: "liquor lithium" appears to be a misspelling of "liquid lithium"

Page 8 line 4: "temperatur" appears to be a mistyping of "temperature".

Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shannon ('482), in view of Birke ('441) in further view of Birke (DE 199 48 548).

Referring to Claim 1, Shannon ('482) discloses the use of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ where x is between 0.1 and 0.5 as a lithium ion conductor (Col 3 line 56). Shannon ('482) further discloses creating the compound $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ by the reaction of other compounds during calcination (Col 4 lines 30-38). Shannon ('482) still further discloses a method of forming a lithium ion conductor made of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ from $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder (Col 5 lines 17-18).

Shannon ('482) fails to disclose the creation of a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ where the starting powder has a mean particle size of not more than 5 microns.

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Birke ('441) discloses that extremely fine $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder exhibits improved internal sliding (Col 6 lines 58-65). It would be obvious to one of ordinary skill in the art that extremely fine powder would mean particles having a mean particle size of less than 5 microns. This is especially true in light of Birke (DE 199 48 548), which discusses particles of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ having a particle size of less than 10 microns (applicant's specification, page 2 lines 7-9).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to combine the method disclosed by Shannon ('482) of creating a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ where x is between 0.1 and 0.5 with that taught by Birke ('441 and DE 199 48 548) of using fine particles (i.e., less than 5 microns) of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ since Birke ('441 and DE 199 48 548) discloses that these particles exhibit improved internal sliding, which would be beneficial in many processing steps.

Referring to Claim 2, Shannon ('482) is relied upon as discussed above.

Shannon ('482) fails to disclose the creation of a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ where the starting powder has a mean particle size of not more than 3 microns.

Birke ('441) discloses that extremely fine $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder exhibits improved internal sliding (Col 6 lines 58-65). It would be obvious to one of ordinary skill in the art that extremely fine powder would mean particles having a mean particle size of less than 3 microns. This is especially true in light of Birke (DE 199 48 548), which discusses particles of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ having a particle size of less than 10 microns (applicant's specification, page 2 lines 7-9).

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It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to combine the method disclosed by Shannon ('482) of creating a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ where x is between 0.1 and 0.5 with that taught by Birke ('441 and DE 199 48 548) of using fine particles (i.e., less than 3 microns) of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ since Birke ('441 and DE 199 48 548) discloses that these particles exhibit improved internal sliding, which would be beneficial in many processing steps.

Referring to Claim 3, Shannon ('482) in view of Birke ('441 and DE 199 48 548) is relied upon as discussed above.

Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above fails to teach the compounds used to form $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ during calcination being lithium phosphate and lithium silicate.

Shannon ('482) further teaches the formation of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ during calcination by reacting lithium phosphate and lithium sulfate (Col 4 lines 31-38).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to combine the method of creating a lithium ion conductor made of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ as taught by Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above by reacting lithium phosphate and lithium silicate during calcination to form $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ since Shannon ('482) discloses that these compounds can effectively be reacted during calcination to form $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$.

Referring to Claim 4, Shannon ('482) in view of Birke ('441 and DE 199 48 548) is relied upon as discussed above.

Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above fails to teach forming a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ wherein shaping is carried out by cold isostatic pressing.

Shannon ('482) further discloses forming a lithium ion conductor of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ by cold isostatic pressing a $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder to create the desired shape (Col 5 lines 21-23).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to create a lithium ion conductor made of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ as taught by Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above by cold isostatic pressing a $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder into the desired shape since Shannon ('482) discloses that cold isostatic pressing is an effective way to form $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$ powder into a desired shape for use as a lithium ion conductor.

Referring to Claim 6, Shannon ('482) in view of Birke ('441 and DE 199 48 548) is relied upon as discussed above.

Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above fails to teach using a temperature of at least 700°C during calcination.

Shannon ('482) further discloses using a temperature in the range of 500°C to 1100°C during calcination (Col 4 lines 40-44).

It would have been obvious to one of ordinary skill in the art, at the time of invention by applicant, to use a temperature of at least 700°C during calcination in forming a lithium ion conductor as taught by Shannon ('482) in view of Birke ('441 and DE 199 48 548) as discussed above since Shannon ('482) discloses that temperatures

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in the range of 500°C to 1100°C are effective for calcination in forming a lithium ion conductor made of $\text{Li}_{4-x}\text{Si}_{1-x}\text{P}_x\text{O}_4$.

Allowable Subject Matter

Claim 5 is objected to as being dependent upon a rejected base claim, but would be deemed allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Russell J. Kemmerle III whose telephone number is 571-272-6509. The examiner can normally be reached on Monday through Friday, 8:30-4:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199. (IN USA OR CANADA) or 571-272-1000.

RK


STEVEN P. GRIFFIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :10 December 2003; 19 March 2004.



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|-------------------|-----------------------|
| Applicant | SCHIERLE-ARNDT et al. |
| Filing Date | Group Art Unit |
| November 10, 2003 | 1741 |

(Use several sheets if necessary)

1741

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

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Form PTO-1449

Sheet 1 of 2

Document Number

Application Number

54142

INFORMATION DISCLOSURE CITATION
IN AN APPLICATION

Applicant SCHIERLE-Arndt et al.

Filing Date

Group Art Unit

(Use several sheets if necessary)

| U.S. PATENT DOCUMENTS | | | | | | |
|---|--|---------|-----------------|-------|-----------|-------------|
| Exam. Init. | Document Number | Date | Name | Class | Sub-Class | Filing Date |
| RK | 6,287,448 | 9/11/01 | Schierle-Arndt | | | |
| RK | 4,042,482 | 8/16/77 | Shannon et al. | | | |
| RK | 5,721,182 | 2/24/98 | Reichert et al. | | | |
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| FOREIGN PATENT DOCUMENTS | | | | | | |
| | Document Number | Date | Country | Class | Sub-Class | Filing Date |
| RK | 199 14221 | 10/00 | Germany | | | |
| RK | 199 48548 | 10/00 | Germany | | | |
| RK | 44 36 392 | 4/96 | Germany | | | |
| RK | 34 15 326 | 10/85 | Germany | | | |
| RK | 2 159 806 | 12/85 | UK | | | |
| RK | 714 850 | 6/96 | European | | | |
| OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.) | | | | | | |
| RK | Ullmann's Encycl. Ind.Chem, 6 th Ed., 2000 Electronic Release, Lithium and Lithium Compounds, Wietelmann et al. | | | | | |
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| EXAMINER /Russell Kemmerle Iii/ DATE CONSIDERED 09/28/2006 | | | | | | |
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Notice of References Cited

Application/Control No.

10/731,161

Applicant(s)/Patent Under
Reexamination
SCHIERLE-ARNDT ET AL.

Examiner

Russell J. Kemmerle III

Art Unit

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Page 1 of 1

U.S. PATENT DOCUMENTS

| * | | Document Number Country Code-Number-Kind Code | Date MM-YYYY | Name | Classification |
|---|---|--|-----------------|--------------|----------------|
| * | A | US-6,706,441 | 03-2004 | Birke et al. | 429/218.1 |
| | B | US- | | | |
| | C | US- | | | |
| | D | US- | | | |
| | E | US- | | | |
| | F | US- | | | |
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| | M | US- | | | |

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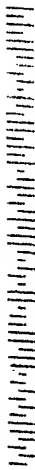
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NON-PATENT DOCUMENTS

| * | | Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages) |
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*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
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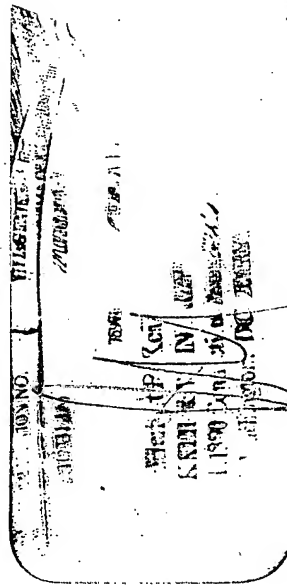
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